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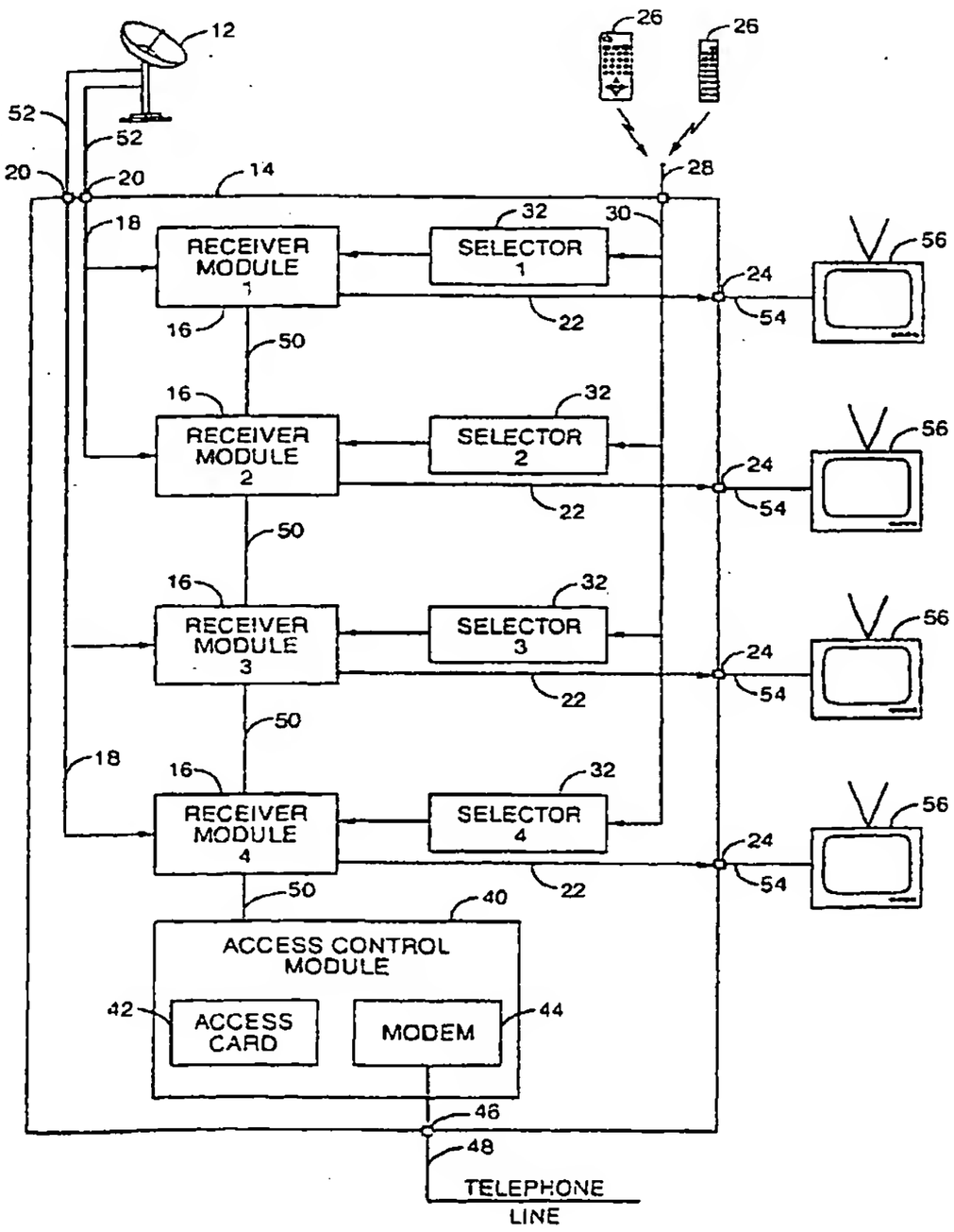

(57) Abstract: A DBS satellite reception system reduces installation costs and discourages theft of service. A plurality of receiver modules (16) containing all necessary signal demodulating, decoding, decrypting, and formatting circuits are colocated in a multi-receiver device (14), with the satellite antenna (12) connected to the input of each receiver. An access control module (40) containing an access card (42) and a modem (44) connected to a telephone line (48) performs programming authorization and communication with the service provider for all receiver modules. The multi-receiver device contains an antenna for reception of remote control commands and distributes them to all receiver modules through selectors (32). The receiver modules generate television signals for distribution to televisions (56) through pre-existing cable networks (RG-59), obviating the need to install RG-6 cable from the satellite antenna to every television. Since one access card controls programming authorization for all receiver modules the call-back requirement of secondary DBS receivers is obviated.

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SATELLITE TELEVISION DISTRIBUTION SYSTEM

FIELD OF THE INVENTION

The present invention relates generally to the field of direct broadcast system (DBS) satellite television reception, and specifically to an improved residential distribution system for television signals.

BACKGROUND OF THE INVENTION

Direct Broadcast Satellite (DBS) systems have enjoyed immense popularity in recent years. DBS refers to a high signal quality, satellite-based, digital television programming distribution system. The heart of the DBS system is a satellite in geosynchronous orbit 22,300 miles above the equator that beams a digitally encoded transmission signal to the earth. This signal carries a wide variety of high signal quality television and radio programming. The signal is received by relatively small (18- or 24-inch) parabolic, or "dish" shaped, antennas. Electronics at the antenna amplify the received signal, and downconvert it from the satellite downlink frequency of 12 GHz to 950-2,000 MHz. The downconverted signal is then sent through a high-quality coaxial cable to a DBS receiver. The receiver demodulates the satellite programming signal, decodes the digital signal and extracts the desired and authorized television signal, which is output in a variety of formats for connection to a television and/or audio system for viewing.

Millions of homes in the U.S. have been wired for cable television, either as part of new construction, or as a retrofit or upgrade to existing homes. Typically, a separate coaxial cable is run from every room in the home to a central location, where some or all of the cables are connected to an incoming cable that provides television programming on a subscription basis. However, the vast majority of these homes have been wired with a

form of coaxial cable that, although sufficient for distribution of cable television signals, is incompatible with the DBS system. Because an active amplifier is needed at the DBS antenna to amplify the weak satellite signal, the antenna requires power from the DBS receiver. This power is supplied on the same coaxial cable that then carries the digital programming signal from the antenna to the receiver. Because older, cable television compatible coaxial cable is not capable of supplying this power, the existing cable in most homes cannot be used for installation of the DBS system. Re-wiring the house, using the more expensive coaxial cable, is thus required for a typical installation.

Most American homes contain more than one television set. If separate program control is desired at more than one television, additional DBS receivers must be purchased and installed. Furthermore, each additional receiver must be independently connected to the DBS antenna, using the high-quality, expensive coaxial cable. Most consumers will also desire a separate remote control to operate each receiver, adding to the cost of a multi-television DBS system. Additionally, the requirement of a separate DBS receiver located at every television adds to the clutter of a room, is aesthetically unappealing, and consumes an electrical outlet slot.

Every DBS receiver contains a telephone connector, for connection to the residential telephone line. The receiver uses the telephone, on a non-interference basis, to report pay-per-view usage to the programming service provider via a modem and a toll-free number. Service providers also use the telephone line for selective access control, such as blocking certain sports programming when an event is being held in the same geographic area in which the receiver is located. Additionally, most service agreements are structured as a monthly subscription fee for selected packages of programming, with a small additional monthly fee per additional receiver. This arrangement risks theft of

service by, for example, subscribing to three receivers at one residence and physically removing two of the receivers to other residences, thus avoiding the base subscription fee at two of the three homes. To combat this possibility, service providers require that all additional receivers in a home, i.e., every receiver in excess of one per home, be continuously connected to a telephone line. The receivers periodically call the service provider's service center, which verifies the location of the receiver through caller-ID functionality. If a non-primary receiver fails to "phone home" within a reasonable time, e.g., 30 days, all its programming access authorization is terminated. Thus, the wiring of a home for more than one DBS receiver additionally entails the provision of a telephone connector in each room where independent program control is desired. Even where a room contains an existing phone connector, it may be occupied by a telephone, or may be inconveniently located, requiring running a telephone cable across the room to the DBS receiver.

It will thus be seen that outfitting a typical home with a full DBS system, for example, independently controllable televisions in the family room, kitchen, master bedroom, and a child's bedroom, entails considerable installation expense. This example would require four separate high-quality coaxial cable runs from the satellite antenna to each room, the purchase of three additional DBS receivers and remote controls, and possibly the installation of telephone lines in any room in which phone service was not previously installed and is currently unused. This level of expense is typically unanticipated by the consumer, who may be confused by advertising touting the low costs of a "complete DBS system" which typically comprises only the satellite antenna and one DBS receiver. This high, unexpected expense results in large numbers of DBS systems

being returned when consumers learn the true costs of installation. The whole experience causes frustration, and can erode consumer confidence in the DBS industry.

There thus exists a need for a multi-receiver residential DBS system that can be installed at relatively low cost and with a minimum of new wiring required. This system should minimize the need for high-quality, expensive coaxial cable, and ideally should take full advantage of existing home cable networks. Additionally, the system should minimize or eliminate the need to install additional telephone connectors throughout the home. Preferably, the system would reduce the clutter and complexity associated with television programming, resulting in only a television, a cable supplying it with a signal, and a remote control for selecting channels, being necessary in each room to independently enjoy the full range of DBS programming. Finally, a system that aids service providers in the prevention of theft of service would save the industry considerable expense, and foment a more trusting relationship between service providers and consumers.

BRIEF SUMMARY OF THE INVENTION

The present invention is a residential digital satellite distribution system for directing satellite programming to a plurality of televisions located within a residence. The system comprises a digital satellite antenna and a multi-receiver device connected to the antenna that includes a plurality of receiver modules. Each receiver module receives digital programming signals from the antenna and extracts programming to produce output television signals. The multi-receiver device is connected to a plurality of television signal cables, which are then connected to televisions within the residence. A plurality of remote control devices are associated with the receiver modules to control their operation.

In one embodiment, the multi-receiver device of the present invention comprises a plurality of receiver modules grouped together in a junction box, remotely from the televisions to which they supply programming. Access control for all receiver modules is via a single authorization control module, containing an access card. Communication with the service provider for all receiver modules is via a single residential telephone line connected to a modem in the access control module.

In another embodiment, the distribution system of the present invention utilizes pre-existing television cable in the residence to establish the connection between the television signal outputs of the multi-receiver device and the televisions within the residence.

In another embodiment, the plurality of receiver modules in the multi-receiver device are programmed with the same identification code. A corresponding identification code and the programming authorization information associated with the residence is contained in an access card within the access control module, thus obviating the need for each receiver module to periodically established communication with the service provider to verify its location.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic representation of the satellite TV distribution system of the present invention, including a block diagram of the multi-receiver device.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figure 1, the present invention comprises a satellite television distribution system, indicated generally at **10**. The system comprises a satellite antenna **12** connected via satellite antenna cables **52** to a multi-receiver device **14**. Multi-receiver

device **14** distributes digital programming signals from satellite antenna **12** to a plurality of receiver modules **16**. Each receiver module **16** decodes the digital programming signal and, if authorized, generates television signals that are distributed to televisions **56**. The receiver module **16** is functionally similar to a DBS receiver "set-top box." The programming extraction at each receiver module **16** is controlled by an RF or UHF remote control **26**, typically located with the television **56** in the residence. Programming authorization and accounting for each remote module **16** is performed by an access control module **40**, containing an access card **42** and a modem **44**. Communication with the service provider is via modem **44** and telephone line **48**. Distribution of television signals from the output **24** of multi-receiver device **14** to televisions **56** may advantageously utilize existing television cable wiring within the residence.

Satellite antenna **12** is a parabolic or "dish" shaped antenna. Antenna **12** is positioned so as to receive digital broadcast signals from one or more broadcast satellites in geosynchronous orbit. Antenna **12** collects the weak satellite broadcast signal and, by virtue of its parabolic shape, reflects the signal into a feedhorn (not shown) positioned at the focus of the parabaloid. The feedhorn channels the signal into a Low Noise Block (LNB) amplifier (not shown) which downconverts the 12 GHz satellite downlink signal to 950-2,000 MHz. and amplifies it for transmission to a DBS receiver.

Multi-receiver device **14** is operatively connected between the satellite antenna **12** and the televisions **56** in the residence. The multi-receiver device **14** contains a plurality of receiver modules **16**, an access control module **40**, RF remote control antenna **28**, and the concomitant wiring and input/output connectors. The multi-receiver device **14** may be disposed in a junction box, and may be located anywhere in the residence that is convenient, e.g., in the attic, exterior to the house, etc. In particular, the junction box

housing the multi-receiver device **14** may advantageously be located at an existing cable distribution junction site, such as the point of connection to an incoming cable television service.

As noted above, each receiver module **16** is the functional equivalent of a stand-alone DBS receiver "set-top box" as far as the signal decoding functions, and contains all the circuitry necessary to extract television programming from the digital programming signal, and produce output for a television to display. The receiver module **16** demodulates, decodes, and if necessary decrypts the digital programming signal from satellite antenna **12**, supplied to the input of receiver module **16**. User channel selection is via an RF or UHF remote control **26**. Selected channels are decoded and transmitted at the output of receiver module **16**, across television signal cables **22** to television signal outputs **24**, unless the selected programming is blocked by access control module **40**. While Figure 1 depicts a multi-receiver device **14** with four receiver modules **16** installed, the present invention is not so limited. The multi-receiver device **14** could contain any number of receiver modules **16**, as dictated by the number of televisions for which independent programming is desired, up to the limits imposed by the LNB on satellite antenna **12**, as can be determined by one of ordinary skill in the art.

Digital programming signal cable **18** comprises coaxial cable that carries the digital programming signal from input terminals **20** to each receiver module **16**. Figure 1 depicts two receiver modules **16** connected to each of two input terminals **20**. Actual connection order and placement may vary, so long as each receiver module **16** is connected to a signal from satellite antenna **12**. Generally, the loads connected to input terminals **20** should be balanced, and the number of receiver modules **16** must not exceed the number supported by the LNB on the satellite antenna **12**. Digital programming signal

cable **18** is of type RG-6 or its functional equivalent. This is generally necessary, as receiver modules **16** supply power to satellite antenna **12**.

The television signal cables **22** connect the outputs of the receiver modules **16** to output terminals **24**. The television signal cables **22** comprise a variety of wiring types and corresponding output terminals **24** may comprise a variety of types of connectors, each appropriate to the type of output signal conveyed. NTSC composite video and audio is carried on coaxial cable, which may be of type RG-59, RG-6, or any other type sufficient to transmit television signals, with conventional coaxial connectors. The receiver modules **16** also output television signals as separate video and audio components, as S-VHS, and output audio in stereo and surround-sound formats. All of these outputs are transmitted on conventional electrical wire, and the connectors are RCA-type plugs. Additionally, the receiver modules **16** may output HDTV format signals in an optical format, which are transmitted on fiber optic cables, terminated at fiber optic connectors.

Since in use, the multi-receiver device **14** will be located remotely from the televisions **56** for which it decodes programming, channel selection on each receiver module 16 will be performed using RF (radio frequency) or UHF (ultra-high frequency) remote control devices **26**. RF- or UHF-based remote control devices **26** are necessary, as radio waves can travel through walls to reach the multi-receiver device **14** from within various rooms in the residence. The remote control devices **26** additionally contain some configurable or programmable identification code to distinguish them from one another.

Control signals from remote control devices **26** are received at the multi-receiver device **14** by remote control antenna **28**, which may be of any suitable size, shape, and placement so as to effectively receive signals from remote control devices **26**. Control

signals then pass through remote control bus **30**, which connects remote control antenna **28** to a selector **32** associated with each receiver module **16**.

The selector **32** monitors or "snoops" the remote control bus **30** for remote control identification codes transmitted with each command sent by remote control devices **26**. Each selector **32** is programmed or configured to recognize one such identification code, and pass the associated command to its associated receiver module **16**. Commands not associated with the correct identification code are ignored. The selector **32** thus acts as a "gate" or filter, only allowing control commands from one remote control device **26** to reach its associated receiver module **16**. The selector **32** may have its identification code programmed into a non-volatile memory, it may be programmed as part of an initialization routine upon start-up, or it may be configured by orientation of a set of switches, either accessible by the user, i.e., mounted on the housing of multi-receiver device **14**, or contained on a printed-circuit board or similar housing of its associated receiver module **16**.

As used herein, "identification code" refers broadly to a means of distinguishing similar functional commands from a plurality of remote control devices **26**, and uniquely associating them with a corresponding receiver module **16**. An identification code may, for example, be an actual identifying code or address transmitted with each command. Alternatively, the identification code could comprise a unique frequency on which each remote control device **26** transmits its commands. As another example, the identification code could comprise each remote control device **26** being assigned a small range of a large code space with which to encode in its commands. The essential requirement is that separate remote control devices **26** in separate rooms within the residence be able to transmit control commands to their respective receiver modules **16** in some manner that

allows a selector 32 to identify and pass through those commands directed to its associated receiver module **16**, and block all others. Any means known in the art to accomplish this function would fall within the scope and spirit of the present invention.

The access control module **40** controls access to programming by receiver modules **16**, and communicates with the service provider. In addition to being digitally encoded, some television programming (also referred to herein as "content") is also encrypted, preventing it from being viewed without authorization. As used herein, the "authorization" means either the status of the programming vis-à-vis a particular user, or the process of ascertaining and acting on that status, as the context dictates. Programming is authorized by the service provider when it is included in the user's paid level of service. Programming may also be dynamically authorized, such as pay-per-view content, with payment billed in arrears. Authorization may operate in the negative, i.e., presumptively authorized material, for example, that within the user's paid level of service, may be denied authorization, for example during regional "blackouts" of sporting events. Different portions of the content may be authorized, depending on the level of service a user has purchased from the service provider. Typically, information concerning a user's service level is encoded in the access card **42**. The access card **42** is a "smart card," a portable medium containing readable and writeable electronic memory. The access card **42** also contains an identification code uniquely associating it with one or more receiver modules **16**.

The access control module **40** also contains a modem **44** for communication via a telephone line **48**, connected to the telephone input **46**. The access control module **40** uses the telephone line **48** on a non-interference basis to communicate with the service provider, e.g., reporting pay-per-view usage. Service providers also use telephonic

communication initiated by the access control module **40** to verify the physical location of the receiver modules **16**, through the telephone number, i.e., via caller-ID functionality.

The access control module **40** contains additional electronics, as may be necessary to implement its authorization, communication, and control functions. For example, the access control module **40** may contain a microprocessor or microcontroller, associated memory, and a stored software control program. The access control module **40** communicates with the receiver modules **16** via a control bus **50**. The control bus **50** may comprise any suitable physical and functional data communications bus, as are well known in the art, and consequently the details of the control bus **50** are not further explicated herein.

Theft of programming, i.e., the reception and viewing of content provided by service providers without payment by users, has long plagued the satellite television industry. DBS service providers have implemented numerous safeguards to prevent unauthorized access of programming. One such safeguard, as explained above, is the requirement that all additional DBS receivers in a residence, i.e., all except the first, must be connected to a telephone line. This allows the service provider to verify the physical location of these additional DBS receivers by requiring that they periodically call the service provider's service center, and allows the service provider to terminate programming authorization for units that fail to be so verified. This approach, however, entails numerous inefficiencies and additional expenses that are mitigated or eliminated by the present invention. By co-locating all receiver modules **16** within the multi-receiver device **14**, and by controlling all receiver modules **16** with a single access control module **40**, the risk of theft of service by removing one of the receiver modules to a different location is virtually eliminated. The key to this result is that digital programming signal

decoding and decrypting circuits on the receiver modules **16** have been decoupled in the present invention from the access card **42**. By programming all of the receiver modules **16** with the same identification code (or alternatively, programming the access card **42** with the identification codes of all of the receiver modules **16**), each receiver module **16** is only functional when in communication with the access control module **40**, and in the embodiment illustrated this is only possible over the control bus 50. The removal of one or more receiver modules 16 to another location renders it ineffective, since its associated access card **42** remains in the multi-receiver device **14**, at the original location. Thus, widespread adoption of the present invention would dramatically reduce the "call back" requirement of secondary receivers, saving the service providers the toll charges associated with the call, and dramatically reducing the programming and signal bandwidth overhead associated with tracking all secondary receivers' location.

The multi-receiver device **14** is connected to the satellite antenna **12** by the satellite antenna cables **52**. The satellite antenna cables **52** are coaxial cables of type RG-6, as required to transfer power from the receiver modules **16** to the satellite antenna **12**. Figure 1 depicts two satellite antenna cables **52**, as required for a dual-output LNB satellite antenna **12**, the most common type presently sold for use with multiple DBS receivers. However, the satellite antenna cables **52** may comprise any number of cables, as required by the number of receiver modules **16** installed in the multi-receiver devise **14**, and by the satellite antenna **12**.

The distribution cables **54** connect the multi-receiver devise **14** to the televisions **56** located in various rooms in the residence. The distribution cables **54** carry demodulated, decoded, and decrypted television signals suitable for direct viewing on the television **56**. As described above relating to the television signal cable **22**, the television

signal is generated by the receiver module **16** in a variety of formats. Hence, the distribution cables **54** may comprise coaxial cable (RG-59 is sufficient), copper wire, fiber-optic cable, etc.

As applied to the many homes that have been previously wired for distribution of television signals from a cable television subscription, the present invention has particular utility over the prior art in dramatically reducing installation costs. In this situation, installation of traditional DBS receivers, i.e., "set-top boxes," requires that a separate satellite antenna cable **52** -- of type RG-6 or equivalent -- be run to every room in which independent reception is desired. In effect, the entire house must be re-wired, using a more expensive form of coaxial cable. The present invention in this situation requires the new installation of only two satellite antenna cables **52**, connecting the satellite antenna **12** with the multi-receiver device **14**. The entire network of distribution cables **54** may comprise existing coaxial cable. Even in cases of new construction or initial wiring of a residence with coaxial cable for television signal distribution, use of the present invention will dramatically reduces installation costs by allowing for the use of less expensive RG-59 type coaxial cable for the distribution network **54**.

An illustrative example of the operation of the present invention will be described herein from the point of view of the user, and with further reference to Figure 1. Assumptions are that the system has been properly installed, the satellite antenna **12** has been properly aimed and is in view of an operative DBS satellite, the access card **24** has been programmed with a valid account number and properly installed, and the system is powered and functional. The Satellite antenna **12** continuously receives the downlink signal from the DBS satellite (not shown). Satellite antenna **12** downconverts and amplifies the satellite signal, and transmits it across the satellite antenna cable **52** to the

multi-receiver device **14** at the input terminals **20**. The satellite programming signal is distributed by the satellite programming signal cable **18** to the input of each receiver module **16**.

A user enters a room in the residence, containing a television **56** connected to a distribution cable **54** and associated with a remote control device **26**. The user turns on the television **56**, and presses the "power" button on the remote control device **26**. The remote control device **26** transmits a "toggle power state" command, along with its unique identification code (as described above). The command and identification code are received by the remote control antenna **28** and transmitted on the remote control bus **30**. All selectors **32** monitor the identification code, and compare it to their stored, programmed, or configured code. One, and only one, selector **32** will recognize the identification code, and transmit the "toggle power state" command to its associated receiver module **16**. The receiver module 16 powers up its receiver circuits. The receiver module **16** takes the satellite programming signal at its input from the satellite programming signal cable **18** and demodulates it. The receiver module **16** decodes the control channel of the satellite programming signal and extracts information about the programming on its active channel. The active channel may be a default channel, or alternatively, it may be the last channel that the receiver module **16** had previously decoded. The receiver module **16** sends its identification code and information about the programming on its currently active channel over the control bus **50** to the access control module **40**. The access control module **40** compares the identification code of that receiver module **16** with the code in the access card **42**. If the identification codes match, and the programming is authorized, i.e., it is a channel included in the user's subscription,

then the access control module **40** sends a control message across the control bus **50** to the receiver module **16**, authorizing the programming.

Upon receiving authorization from the authorization control module **40**, the receiver module **16** proceeds to demodulate, decode, and, if necessary, decrypt the programming from the digital programming signal at its input. The receiver module **16** outputs a television signal across television the signal cable **22** in a variety of formats, as described above. The television signal is transmitted through the distribution cable **54**, connected between the output terminal **24** and the television **56**. The television **56** receives the television signal from the distribution cable **54** and displays the programming to the user.

The user may, from time to time, enter other commands on the remote control device **26**, such as for example, to tune to a different channel. The above-described process for transmitting the remote control command through the proper selector **32** to the proper receiver module **16** is repeated. The receiver module **16** decodes control information from the newly requested channel and again requests authorization from the authorization control module across the control bus **50**. The request may be, for example, for a pay-per-view channel. In this case, the authorization control module **40** will authorize the receiver module **16** to decode the programming, and will continue to monitor the status of the receiver module **16**. After a predetermined duration of time has elapsed with the receiver module **16** decoding the pay-per-view channel, the authorization control module will record identifying information about the decoding of the channel. The receiver module **16**, having received its authorization, will demodulate and decode the requested channel, outputting a television signal to be viewed by the user on the television **56**. At some time, the access control module **40**, via the modem **44**, will detect inactivity

on the residential telephone line **48**. The access control module **40** will then command the modem **44** to call the toll-free number of the service provider's service center. The access control module **40** is identified by the service center, and uploads the pay-per-view information for addition to the user's next bill.

Various interactions between the access control module **40** and the service center relating to security and programming access are possible. For example, "blackouts" and other programming adjustments can be carried out by the access control module **40**. Similarly, the access control module **40** may engage in additional interactions with the receiver module **16**, such as locking out certain channels unless a parental access code is entered through the remote control device **26**.

The above description explains the functional interrelationship of the various parts of the present invention, in sufficient detail to enable one of ordinary skill in the art to make and practice the invention. The present invention is not, however, limited by this explanation, and one of ordinary skill in the art will readily recognize a wide variety of alternative implementation and procedural details to effect functionality, all of which fall within the scope and spirit of the present invention, as claimed below.

CLAIMS

What is claimed is:

1. A multi-receiver device operative to be installed between a satellite dish and a plurality of televisions located within a structure, comprising:

a plurality of receiver modules adapted to be connected to the satellite dish, and wherein each receiver module is further connected to a respective television located in the structure for directing a satellite television signal from the satellite dish to a respective television; and

wherein the plurality of receiver modules are located remotely from the respective televisions being served.

2. The multi-receiver device of claim 1, wherein said plurality of receiver modules are grouped together.

3. The multi-receiver device of claim 1, wherein each said receiver module is programmed to be remotely controlled.

4. The multi-receiver device of claim 3, including a plurality of remote control devices for remotely controlling said plurality of receiver modules.

5. The multi-receiver device of claim 1, wherein each said receiver module is connected to a respective television via an existing television cable extending through the structure.

6. The multi-receiver device of claim 1, including an authorization control module operatively connected to said plurality of receiver modules for controlling content.

7. The multi-receiver device of claim 6, wherein said authorization control module includes a telephone connection that is utilized from time to time to verify the location of each said receiver module.

8. The multi-receiver device of claim 1, wherein said receiver modules are grouped together and remotely controlled.

9. A residential digital satellite distribution system for directing satellite programming to a plurality of televisions located in a plurality of rooms, comprising:

a digital satellite antenna;

a multi-receiver device including:

i) a plurality of receiver modules adapted to be located remotely from said plurality of televisions, with each said receiver module including a digital programming signal input and a television signal output,

ii) each said receiver module adapted to receive digital programming signals from said antenna and to extract programming therefrom to produce output television signals; and

iii) an access control module operatively connected to said plurality of receiver modules for controlling the content of programming extracted by respective receiver modules;

at least one cable connected between said antenna and said digital programming signal inputs of said receiver modules for transmitting digital programming signals from said antenna to said plurality of receiver modules;

a series of output cables connected between the television signal outputs of said receiver modules and respective televisions for transmitting television signals from said receiver modules to respective televisions; and

a plurality of remote control devices operatively programmed to control said plurality of receiver modules.

10. The residential digital satellite distribution system of claim 9, wherein said multi-receiver device includes a junction box wherein said plurality of receiver modules and said access control module are housed within said junction box.

11. The residential digital satellite distribution system of claim 9, wherein said access control module includes a preprogrammed medium that:

i) verifies that said respective receiver modules are authorized, and

ii) controls the programming extracted by each of said receiver modules.

12. The residential digital satellite distribution system of claim 9, wherein said access control module includes a telephone input connected to a modem for further:

1) verifying the location of said respective receiver modules, and

2) selectively adjusting the programming that said receiver modules may extract from said digital programming signal.

13. The residential digital satellite distribution system of claim 9, wherein said access control module is further programmed to account for pay-per-view use and to communicate that accounting to a service provider.

14. The residential digital satellite distribution system of claim 9, wherein said television output cable includes a plurality of pre-wired cables that extend from said receiver module device through a residence having televisions located therein.

15. A method of installing a direct satellite system in a residence, comprising:

providing a satellite antenna exterior to the residence and positioned so as to receive a direct broadcast satellite signal;

locating and grouping a plurality of receiver modules together and remotely from a plurality of rooms in the residence;

connecting each receiver module to said satellite antenna such that digital programming signals can be directed from said satellite antenna to each receiver module; and

connecting a television signal output associated with each receiver module to one of the televisions in the residence.

16. The method of claim 15 further including connecting a single access control module to each receiver module and controlling authorization and programming for said plurality of receiver modules through said single access control module.

17. The method of claim 16 wherein said access control module is operatively connected to a single residential telephone line, whereby billing and authorization functions for all said receiver modules are conducted via said telephone line.

18. The method of claim 15, including installing a digital satellite system in a residence that has been pre-wired with a plurality of television cables that extend to a plurality of rooms in the residence; and

wherein the step of connecting the television signal output associated with each receiver module to one of the televisions in the residence includes utilizing the pre-wired television cables to connect said receiver modules to said televisions.

19. The method of claim 18 including housing a plurality of receiver modules in a junction box, and locating said junction box remotely from a plurality of rooms in the residence.

20. The method of claim 15, wherein said plurality of receiver modules are adapted to be remotely controlled by a corresponding plurality of remote control devices.

21. A method of discouraging the theft of programming in a direct satellite system, comprising programming a plurality of receiver modules such that each is exclusively associated with a single access control module, and such that none of said plurality of receiver modules is authorized to operate when not connected to said access control module.

22. The method of claim 21, wherein said plurality of receiver modules are all programmed with the same identification code, and wherein said access control module is programmed to recognize that identification code.

23. The method of claim 21, wherein said plurality of receiver modules are located to communicate with said access control module, and wherein the need for validation of location of said receiver modules via telephone is obviated.

24. A method of providing direct satellite system programming in a residence containing a plurality of televisions, comprising:

providing a satellite antenna exterior to the residence and positioned so as to receive a direct broadcast satellite signal;

locating and grouping a plurality of receiver modules together in a junction box and remotely from a plurality of rooms in the residence, said junction box containing an access control module for authorizing the extraction of programming by each said receiver module, and operatively connected to a single residential telephone line for communicating with a service provider;

connecting each receiver module to said satellite antenna such that digital programming signals can be directed from said satellite antenna to each receiver module;

connecting a television signal output associated with a respective receiver module to one of the televisions in the residence; and

associating each said receiver module with a remote control device such that the programming extracted by each receiver module is operatively controlled by a corresponding remote control device from within the residence.

25. The method of claim 24, wherein said access control module comprises a single unit, and authorization is only established when said access control module is connected to said receiver modules.

26. The method of claim 24, wherein said access control module functions to authorize programming extraction by said receiver modules by:

identifying said receiver modules according to their identification code,

comparing said identification code with the code on a preprogrammed medium contained within said access control module,

instructing said receiver modules to block all programming extraction if said codes do not match, and, if said codes do match,

instructing said receiver modules to allow the programming extraction that has been authorized.

27. The method of claim 24, wherein said residence has been pre-wired with television cable, and wherein said step of connecting a television signal output associated with each receiver module to one of the televisions in the residence comprises utilizing said pre-wired cable.

28. A computer readable medium in the form of software for controlling a plurality of receiver modules operatively connected between a digital satellite dish and a series of televisions, said software adapted to:

i) control the content of programming extracted by the plurality of receiver modules; and

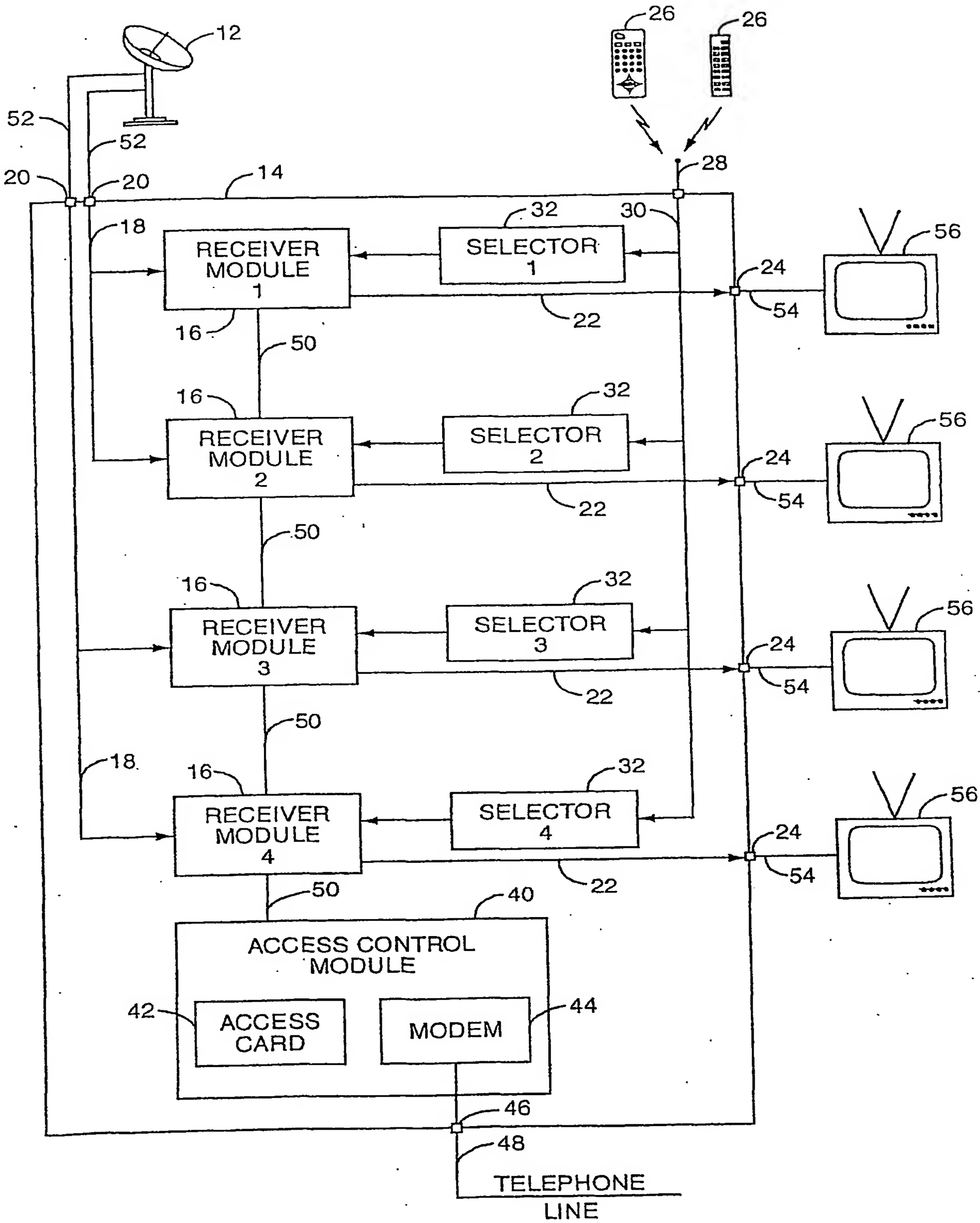
ii) verify that the respective receiver modules are authorized.

29. The computer readable medium of claim 28 wherein the software is further adapted to verify the location of the plurality of receiver modules.

30. The computer readable medium of claim 28 wherein the software is further adapted to selectively adjust the programming that said plurality of receiver modules may extract from digital programming signals being directed to the receiver modules from the digital satellite antenna.

31. The computer readable medium of claim 28 wherein said software is further adapted to account for pay-for-view use and to communicate that accounting to a service provider.

32. The computer readable medium of claim 28 wherein said software is associated with an access control module that is operatively connected to each of the receiver modules, and wherein said access control module includes a modem that is operatively connected to a telephone line for communicating with a service provider.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RECEIVER MODULE 1
SELECTOR 1
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RECEIVER MODULE 2
SELECTOR 2
RECEIVER MODULE 3
SELECTOR 3
RECEIVER MODULE 4
SELECTOR 4
40
ACCESS CONTROL MODULE
42
ACCESS CARD
MODEM
44
46
48
TELEPHONE LINE

FIG. 1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/29335

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H04H 1/00; H04N 7/20
US CL :455/3.02; 725/71, 85, 152

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 455/3.01-3.06, 130, 132, 133, 140, 149, 151.1-151.4; 725/63, 64, 68, 71, 74, 78, 85, 91, 151, 152

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPAT, PGPUBS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,936,660 A (GURANTZ) 10 August 1999, col. 1, lines 28-31, col. 2, lines 13-19 & 35-67, col. 3, lines 1-34 & 63-66, col. 4, lines 1-55.	1-6, 8-11, 14-16, 18-21, 23, 28, 30
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Y		7, 12-13, 17, 22-27, 29, 31-32
Y	US 5,802,063 A (DEISS) 01 September 1998, col. 4, line 53 - col. 5, line 31.	7, 12-13, 17, 22-27, 29, 31-32
A	US 5,805,975 A (GREEN, SR. et al.) 08 September 1998, abstract.	1, 9, 15, 24

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 13 NOVEMBER 2001	Date of mailing of the international search report 14 DEC 2001
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Form PCT/ISA/210 (second sheet) (July 1998)★